

CLAIMS

What we claim:

1 1. A method of allocating a communication medium between a plurality of
2 stations in a network, comprising:
3 dynamically assigning one of the stations as a starting bus master;
4 the starting bus master establishing an order in which the stations have access to the
5 communication medium;
6 appointing an ending bus master to a last station in the order;
7 the starting bus master sending the order to all of the stations in the network;
8 the starting bus master initiating a message sequence with a beginning of sequence
9 message;
10 the stations transmitting their messages after the beginning of sequence message
11 according to the order; and
12 the ending bus master appending an end of sequence message which indicates an end
13 of the message sequence.

1 2. The method as set forth in claim 1, wherein transmitting messages comprises
2 monitoring at each station for the message from a preceding station in the order.

1 3. The method as set forth in claim 1, wherein transmitting messages comprises
2 transmitting message of varying sizes.

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1 4. The method as set forth in claim 1, wherein transmitting messages includes
2 transmitting a synch message indicating that no data is being transmitted.

1 5. The method as set forth in claim 1, wherein assigning one of the stations as the
2 starting bus master comprises assigning the bus master to a station at an end of the
3 communication medium.

1 6. The method as set forth in claim 5, wherein assigning the starting bus master
2 to the station at the end of the communication medium comprises sending queries to each
3 station in the network and measuring delay time associated with responses from each station.

1 7. The method as set forth in claim 1, wherein assigning the starting bus master
2 comprises assigning the first station as the bus master.

1 8. The method as set forth in claim 1, further comprising detecting a new station
2 and adding the new station to the order.

1 9. The method as set forth in claim 8 wherein adding the new station to the order
2 is performed by the starting bus master and the starting bus master sends the order having the
3 new station to all stations.

1 10. The method as set forth in claim 8, wherein adding the new station to the order
2 is performed by all stations.

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1 11. The method as set forth in claim 8, wherein detecting the new station
2 comprises detecting a new station message inserted by the new station after the end of
3 sequence message.

1 12. The method as set forth in claim 8, further comprising assigning the starting
2 bus master to the new station.

1 13. The method as set forth in claim 8, wherein detecting and adding the new
2 station dynamically recomputes the length of the communication medium.

1 14. The method as set forth in claim 1, further comprising detecting a removal of
2 one of the stations from the network and removing the one station from the order.

1 15. The method as set forth in claim 14, wherein removing the one station from
2 the order is performed by the starting bus master and the starting bus master provides the
3 order without the one station to all stations.

1 16. The method as set forth in claim 14, wherein removing the one station from
2 the order is performed by all stations.

1 17. The method as set forth in claim 14, wherein detecting the removal of the one
2 station comprises not detecting any message from the one station for a period of time.

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1 18. The method as set forth in claim 14, wherein the one station removed from the
2 network comprises the starting bus master and the method further comprises assigning the
3 starting bus master to another one of the stations in the network.

1 19. The method as set forth in claim 14, wherein the one station removed from the
2 network comprises the ending bus master and the method further comprises assigning the
3 ending bus master to another one of the stations in the network.

1 20. The method as set forth in claim 14, wherein detecting the removal of the one
2 station comprises reducing a length of the communication medium.

1 21. The method as set forth in claim 1, further comprising monitoring messages
2 transmitted by the stations and generating an event log.

1 22. The method as set forth in claim 21, wherein generating the event log
2 comprises identifying each station in the network and indicates an order of transmission
3 authority.

1 23. The method as set forth in claim 21, wherein generating the event log
2 comprises recording errors detected during operation of the network.

1 24. The method as set forth in claim 21, wherein generating the event log
2 comprises tracking successful delivery of each message.

1 25. The method as set forth in claim 21, further comprising tracking a wavelength
2 of operation for each station.

1 26. The method as set forth in claim 1, further comprising assigning a unique
2 address to each station.

1 27. The method as set forth in claim 1, further comprising assigning stations
2 different wavelengths to transmit messages.

1 28. The method as set forth in claim 1, further comprising assigning stations
2 wavelengths to receive messages.

1 29. The method as set forth in claim 1, further comprising assigning stations
2 frequencies to transmit messages.

1 30. The method as set forth in claim 1, further comprising assigning stations
2 frequencies to receive messages.

1 31. The method as set forth in claim 1, further comprising detecting an absence of
2 a message from one of the stations.